SUPER®

SUPER X5DA8
SUPER X5DAE
SUPER X5DAL-G
SUPER X5DAL-TG2

USER'S MANUAL

Revision 1.1b

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER X5DA8/X5DAE/X5DAL-G/X5DAL-TG2 motherboard. The SUPER X5DA8/X5DAE/X5DAL-G/X5DAL-TG2 supports single or dual Intel® 604/603-pin Xeon™ processors at up to 3.20 GHz at a 533/400 MHz front side bus. Please refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Product_page/product-m.htm) for updates on supported processors. This product is intended to be professionally installed.

Manual Organization

Chapter 1 begins with a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the motherboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when you want to install the processor and DIMM memory modules and when mounting the motherboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, the IDE interfaces, the parallel and serial ports, the keyboard and mouse, the power supply and various control panel buttons and indicators.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ (Frequently Asked Questions) section is provided. Instructions are also included for contacting technical support. In addition, you can visit our web site (at www.supermicro.com/techsupport.htm) for more detailed information.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A gives information on BIOS POST messages.

Appendix B provides BIOS POST codes.

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Chapter 1
Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

One (1) Supermicro Mainboard

One (1) ribbon cable for IDE devices

One (1) floppy ribbon cable

One (1) four-port USB 2.0 cable (retail only)

Two (2) Pentium 4 Xeon active heatsinks (FAN-050-T, retail/single package for X5DA8/X5DAE only)

Two (2) heatsink retention clips (SKT-095-604E)

Two (2) Xeon mounting plates (SKT-120-P, X5DAL-G/-TG2 only)

One (1) I/O backpanel shield

One (1) Supermicro CD or diskettes containing drivers and utilities

One (1) User's/BIOS Manual

SCSI Accessories (X5DA8 only)

One (1) 68-pin LVD Ultra320/160 SCSI cable

One (1) set of SCSI driver diskettes

One (1) SCSI manual

Contacting Supermicro

Headquarters

Address: SuperMicro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.
Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)
Web Site: www.supermicro.com

Europe

Address: SuperMicro Computer B.V.
Het Sterrenbeeld 28, 5215 ML
's-Hertogenbosch, The Netherlands
Tel: +31 (0) 73-6400390
Fax: +31 (0) 73-6416525
Email: sales@supermicro.nl (General Information)
support@supermicro.nl (Technical Support)
rma@supermicro.nl (Customer Support)

Asia-Pacific

Address: SuperMicro, Taiwan
D5, 4F, No. 16 Chien-Ba Road
Chung-Ho 235, Taipei Hsien, Taiwan, R.O.C.
Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3991
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8228-1366, ext.132 or 139

Notes

Figure 1-1. SUPER X5DA8 Image

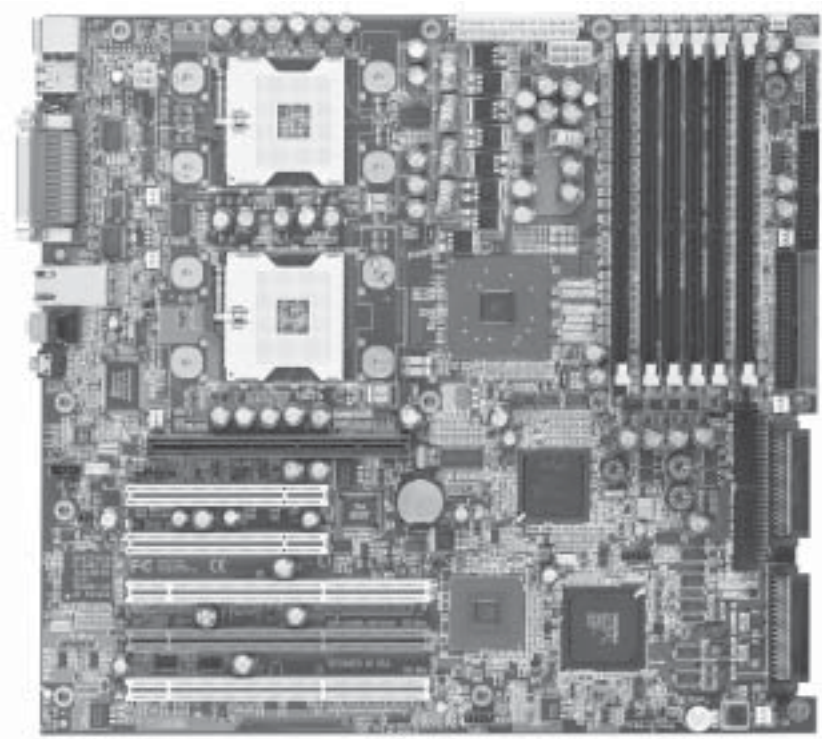


Figure 1-2. SUPER X5DAE Image

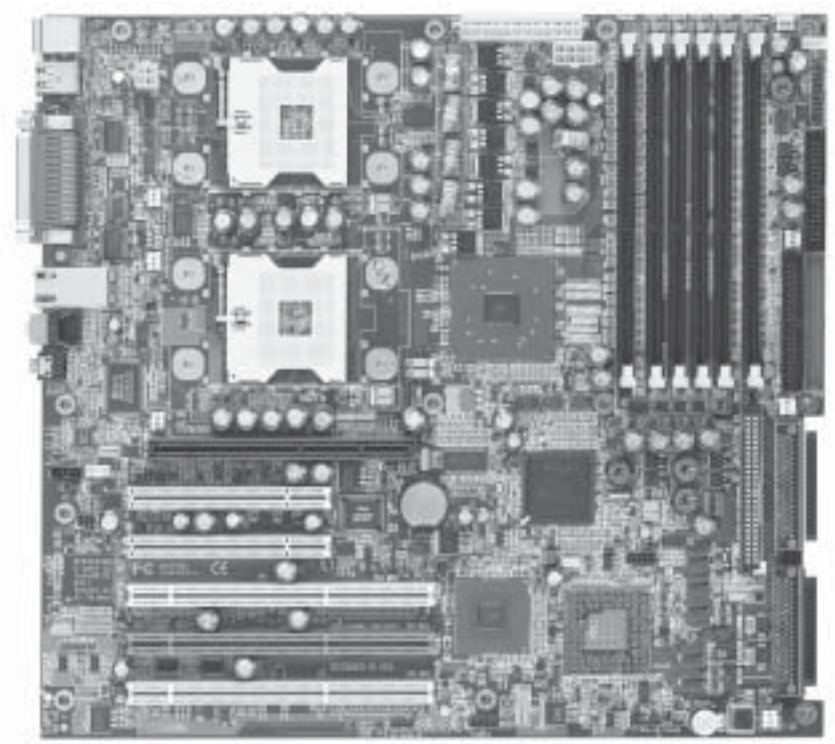


Figure 1-3. SUPER X5DAL-G Image

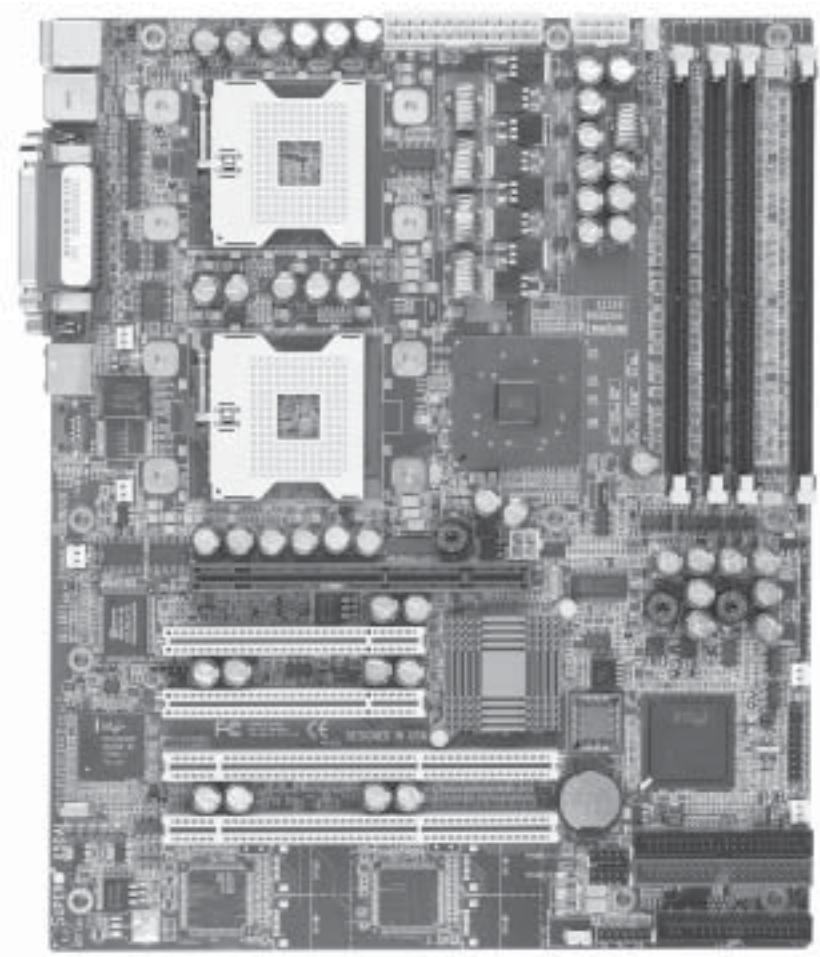


Figure 1-4. SUPER X5DAL-TG2 Image

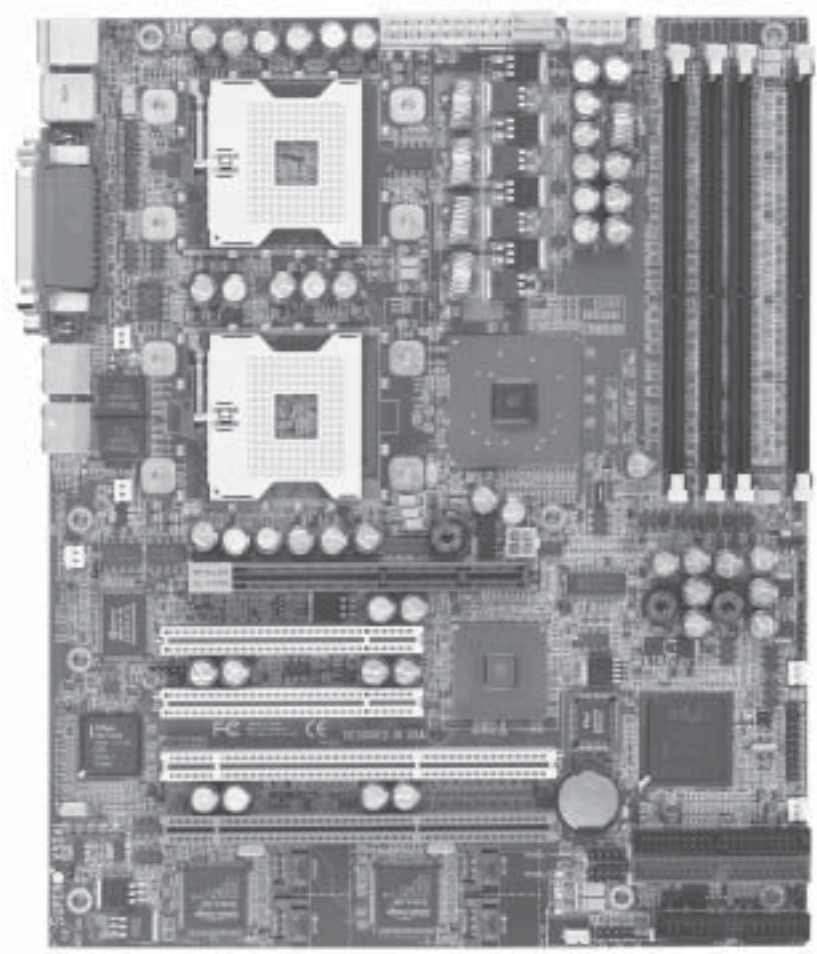
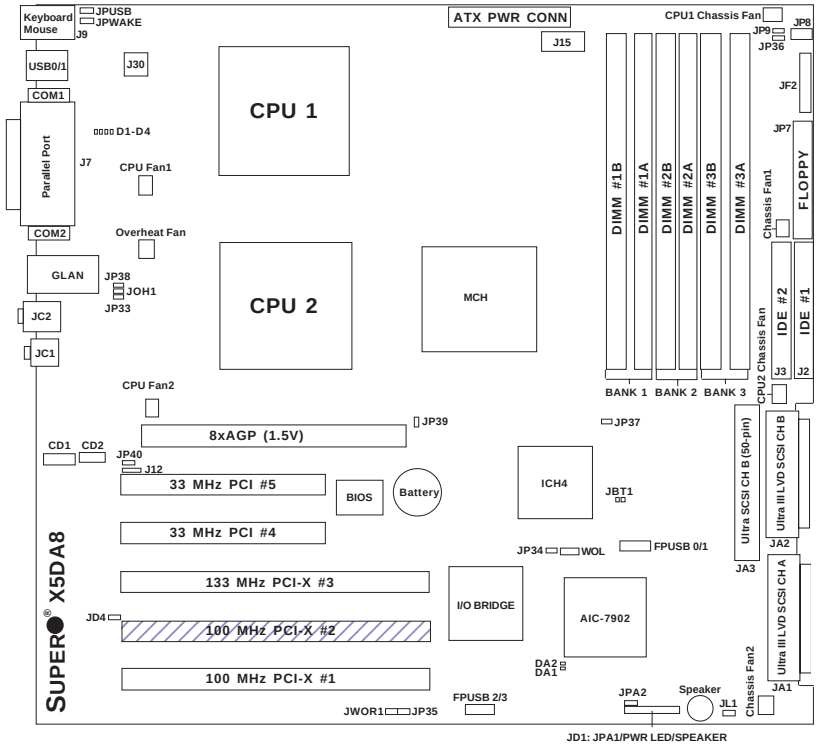


Figure 1-5. SUPER X5DA8 Layout
(not drawn to scale)



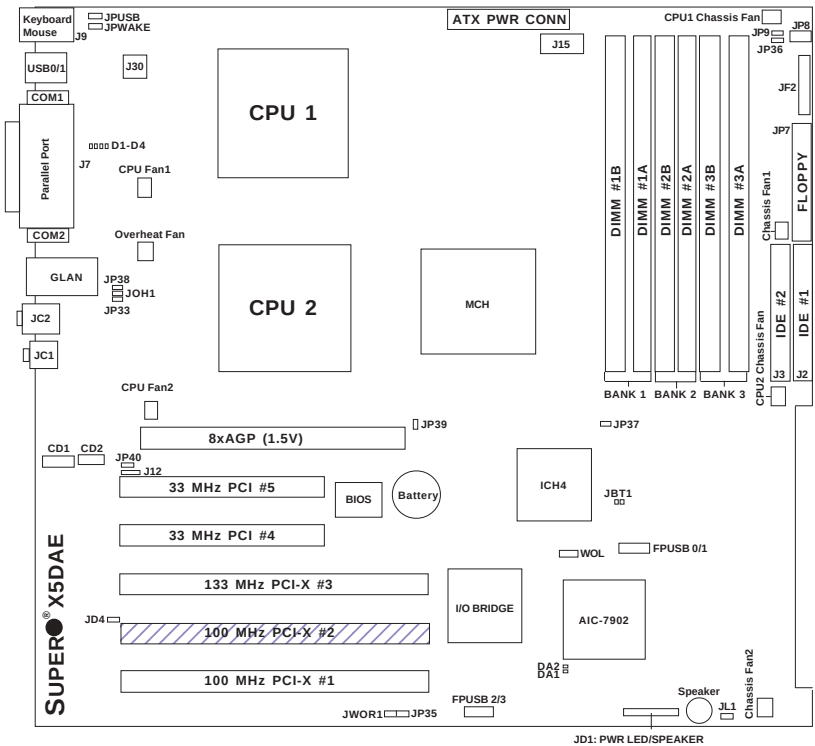
Jumpers not noted are for test purposes only.

X5DA8 Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	See Chapter 2
JD4	GLAN Enable/Disable	Pins 1-2 (Enabled)
JP9	Power Fail Alarm En/Disable	Open (Disabled)
JP33	CPU Chassis/CPU Fan Select	Closed (CPU Fan)
JP34	SCSI Enable/Disable	Pins 1-2 (Enabled)
JP37	Watch Dog	Pins 2-3 (NMI)
JP38	Thermal Fan Control	See Chapter 2
JP39	System (Front Side) Bus Speed	Pins 1-2 (Auto)
JP40	Onboard Audio Enable/Disable	Pins 1-2 (Enabled)
JPA1/JPA2	SCSI CH A/B Termination	Open (Enabled)
JPUSB	USB Wake-up	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake-up	Pins 1-2 (Disabled)

Connector	Description
ATX PWR CONN	Primary ATX Power Connector
CD1/CD2	Audio CD Input (large/small)
COM1/COM2	COM1/COM2 Serial Port Connector
CPU/CHS/OH FAN	CPU/Chassis/Overheat Fan Headers
DIMM#1A-DIMM#3B	Memory (RAM) Slots
FPUSB0/1/2/3	Front Panel USB Headers
GLAN	G-bit Ethernet Port
J2/J3	IDE1/2 Hard Disk Drive Connector
J7	Parallel (Printer) Port
J9	PS/2 Keyboard/Mouse Ports
J12	IR/CIR Header
J15	Processor Power Connector
J30	Power Conn. (for use with AGP Pro cards)
JA1/JA2/JA3	Ultra320 LVD SCSI CH A/B/B Connector
JC1/JC2	MIC/LINE IN LINE OUT
JD1	PWR LED/Speaker Header
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP7	Floppy Disk Drive Connector
JP8	Third Power Supply Fail Header
JP35	Keylock Switch Connector
JP36	Power Supply Fail Alarm Reset Switch
JWOR1	Wake-on-Ring Header
USB0/1	Universal Serial Bus Ports
WOL	Wake-on-LAN Header

Figure 1-6. SUPER X5DAE Layout
(not drawn to scale)



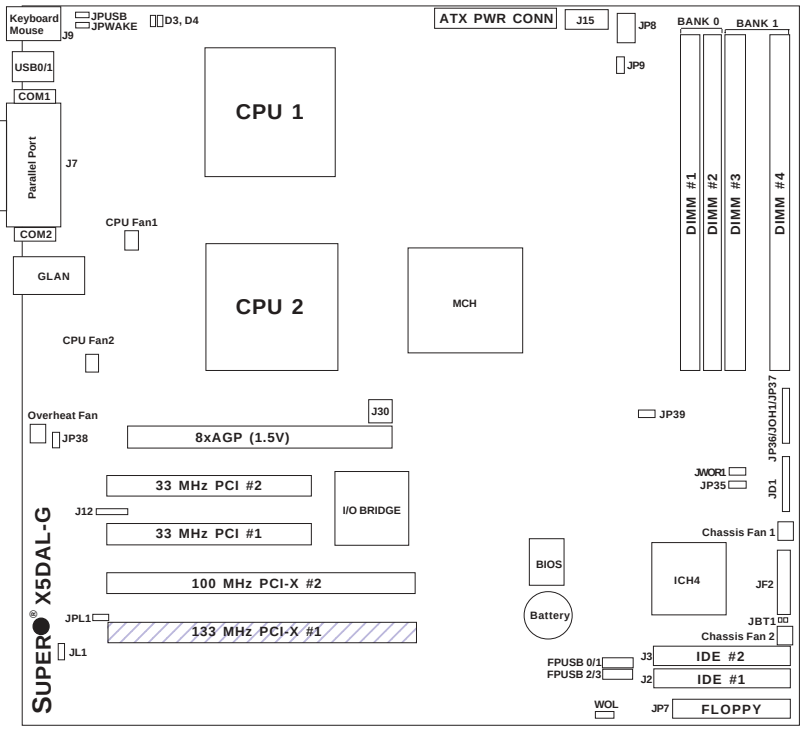
Jumpers not noted are for test purposes only.

X5DAE Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	See Chapter 2
JD4	GLAN Enable/Disable	Pins 1-2 (Enabled)
JP9	Power Fail Alarm En/Disable	Open (Disabled)
JP33	CPU Chassis/CPU Fan Select	Closed (CPU Fan)
JP37	Watch Dog	Pins 2-3 (NMI)
JP38	Thermal Fan Control	See Chapter 2
JP39	System (Front Side) Bus Speed	Pins 1-2 (Auto)
JP40	Onboard Audio Enable/Disable	Pins 1-2 (Enabled)
JPUSB	USB Wake-up	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake-up	Pins 1-2 (Disabled)

Connector	Description
ATX PWR CONN	Primary ATX Power Connector
CD1/CD2	Audio CD Input (large/small)
COM1/COM2	COM1/COM2 Serial Port Connector
CPU/CHS/OH FAN	CPU/Chassis/Overheat Fan Headers
DIMM#1A-DIMM#3B	Memory (RAM) Slots
FPUSB0/1/2/3	Front Panel USB Headers
GLAN	G-bit Ethernet Port
J2/J3	IDE1/2 Hard Disk Drive Connector
J7	Parallel (Printer) Port
J9	PS/2 Keyboard/Mouse Ports
J12	IR/CIR Header
J15	Processor Power Connector
J30	Power Conn. (for use with AGP Pro cards)
JC1/JC2	MIC/LINE IN LINE OUT
JD1	PWR LED/Speaker Header
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP7	Floppy Disk Drive Connector
JP8	Third Power Supply Fail Header
JP35	Keylock Switch Connector
JP36	Power Supply Fail Alarm Reset Switch
JWOR1	Wake-on-Ring Header
USB0/1	Universal Serial Bus Ports
WOL	Wake-on-LAN Header

Figure 1-7. SUPER X5DAL-G Layout
(not drawn to scale)



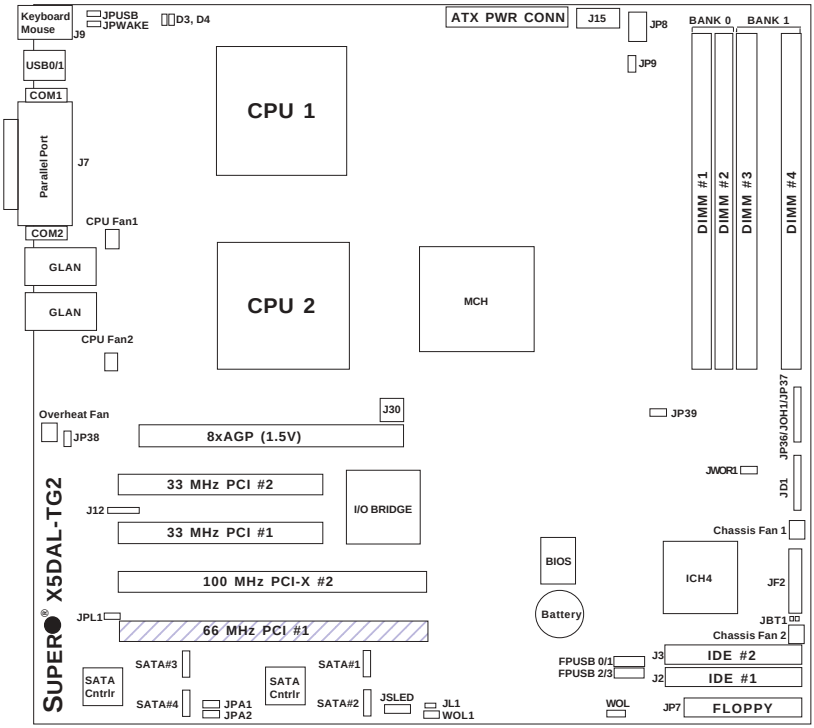
Jumpers not noted are for test purposes only.

X5DAL-G Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	See Chapter 2
JP9	Power Fail Alarm En/Disable	Open (Disabled)
JP37	Watch Dog	Pins 2-3 (NMI)
JP38	Thermal Fan Control	See Chapter 2
JP39	System (Front Side) Bus Speed	Pins 1-2 (Auto)
JPA1/JPA2	Serial ATA Enable/Disable	Pins 1-2 (Enabled)
JPL1	GLAN Enable/Disable	Pins 1-2 (Enabled)
JPUSB	USB Wake-up	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake-up	Pins 1-2 (Disabled)

Connector	Description
ATX PWR CONN	Primary ATX Power Connector
COM1/COM2	COM1/COM2 Serial Port Connector
CPU/CHS/OH FAN	CPU/Chassis/Overheat Fan Headers
DIMM#1-DIMM#4	Memory (RAM) Slots
FPUSB0/1/2/3	Front Panel USB Headers
GLAN	G-bit Ethernet Port
J2/J3	IDE1/2 Hard Disk Drive Connector
J7	Parallel (Printer) Port
J9	PS/2 Keyboard/Mouse Ports
J12	IR/CIR Header
J15	Processor Power Connector
J30	Power Conn. (for use with AGP Pro cards)
JD1	PWR LED/Speaker Header
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP7	Floppy Disk Drive Connector
JP8	Third Power Supply Fail Header
JP35	Keylock Switch Connector
JP36	Power Supply Fail Alarm Reset Switch
JWOR1	Wake-on-Ring Header
USB0/1	Universal Serial Bus Ports
WOL1	Wake-on-LAN Header

Figure 1-8. SUPER X5DAL-TG2 Layout
(not drawn to scale)



Jumpers not noted are for test purposes only.

X5DAL-TG2 Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	See Chapter 2
JP9	Power Fail Alarm En/Disable	Open (Disabled)
JP37	Watch Dog	Pins 2-3 (NMI)
JP38	Thermal Fan Control	See Chapter 2
JP39	System (Front Side) Bus Speed	Pins 1-2 (Auto)
JPA1	SATA #1/#2 Enable/Disable	Pins 1-2 (Enabled)
JPA2	SATA #3/#4 Enable/Disable	Pins 1-2 (Enabled)
JPL1	GLAN Enable/Disable	Pins 1-2 (Enabled)
JPUSB	USB Wake-up	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake-up	Pins 1-2 (Disabled)

Connector	Description
ATX PWR CONN	Primary ATX Power Connector
COM1/COM2	COM1/COM2 Serial Port Connector
CPU/CHS/OH FAN	CPU/Chassis/Overheat Fan Headers
DIMM#1-DIMM#4	Memory (RAM) Slots
FPUSB0/1/2/3	Front Panel USB Headers
GLAN	G-bit Ethernet Port
J2/J3	IDE1/2 Hard Disk Drive Connector
J7	Parallel (Printer) Port
J9	PS/2 Keyboard/Mouse Ports
J12	IR/CIR Header
J15	Processor Power Connector
J30	Power Conn. (for use with AGP Pro cards)
JD1	PWR LED/Speaker Header
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP7	Floppy Disk Drive Connector
JP8	Third Power Supply Fail Header
JP35	Keylock Switch Connector
JP36	Power Supply Fail Alarm Reset Switch
JSLED	Serial ATA Drive Activity
JWOR1	Wake-on-Ring Header
USB0/1	Universal Serial Bus Ports
WOL1	Wake-on-LAN Header

Motherboard Features

CPU

- Single or dual Intel® 604/603-pin Xeon™ processors of up to 3.20 GHz at a 533/400 MHz front side (system) bus speed.

  Note: Please refer to the support section of our web site for a complete listing of supported processors (http://www.supermicro.com/TechSupport.htm).

Memory

- X5DA8/X5DAE: Six 184-pin DIMM sockets supporting up to 12 GB of registered ECC DDR-266/200 (PC2100/1600) SDRAM
- X5DAL-G/X5DAL-TG2: Four 184-pin DIMM sockets supporting up to 8 GB of registered ECC or unbuffered ECC DDR-266/200 (PC2100/1600) SDRAM

  Note: Interleaved memory; requires memory modules to be installed in pairs. See Section 2-3 for details.

Chipset

- Intel E7505 chipset

Expansion Slots

- X5DA8/X5DAE
  - One 64-bit, 133 MHz PCI-X
  - Two 64-bit, 100 MHz PCI-X
  - Two 32-bit, 33 MHz PCI
  - One 8xAGP Pro (1.5V)
- X5DAL-G/X5DAL-TG2
  - One 64-bit, 133 MHz PCI-X*
  - One 64-bit, 100 MHz PCI-X
  - Two 32-bit, 33 MHz PCI
  - One 8xAGP Pro (1.5V)

* This is a 64-bit, 66 MHz PCI slot on the X5DAL-TG2.

BIOS

- 4 Mb Phoenix® Flash ROM
- APM 1.2, DMI 2.1, PCI 2.2, ACPI 1.0, Plug and Play (PnP), SMBIOS 2.3

PC Health Monitoring

- Onboard voltage monitors for CPU cores, chipset voltage, 3.3V, +5V, +12V and 3.3V standby
- Fan status monitor with firmware/software on/off control
- CPU/chassis temperature monitors
- Environmental temperature monitor and control
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat

- CPU overheat LED header
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU core
- System overheat LED and control
- Chassis intrusion detection
- System resource alert

ACPI Features (optional)

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- Main switch override mechanism

Onboard I/O

- AIC-7902 for dual channel Ultra320 SCSI (X5DA8)
- Zero channel SCSI RAID support (green slot, X5DA8)
- Support for up to four Serial ATA hard drives (X5DAL-TG2)
- Zero channel Serial ATA RAID support (green slot, X5DAL-TG2)
- Intel 82545EM Gb Ethernet controller
- Intel EW82546EB dual Gb Ethernet controller (X5DAL-TG2)
- 2 EIDE Ultra DMA/100 bus master interfaces
- 1 floppy port interface (up to 2.88 MB)
- 2 Fast UART 16550A compatible serial ports
- 1 EPP/ECP Parallel Port
- PS/2 mouse and PS/2 keyboard ports
- Up to 6 USB 2.0 (Universal Serial Bus) ports
- AC'97 Audio CODEC (not on X5DAL-G, X5DAL-TG2)

Other

- Internal/external modem ring-on
- Wake-on-LAN (WOL)
- Console redirection

CD/Diskette Utilities

- BIOS flash upgrade utility and device drivers

Dimensions

- X5DA8: Extended ATX, 12" x 13.05" (304.8 x 331.5 mm)
- X5DAE: Extended ATX, 12" x 13.05" (304.8 x 331.5 mm)
- X5DAL-G/X5DAL-TG2: ATX, 12" x 9.8" (304.8 x 249 mm)

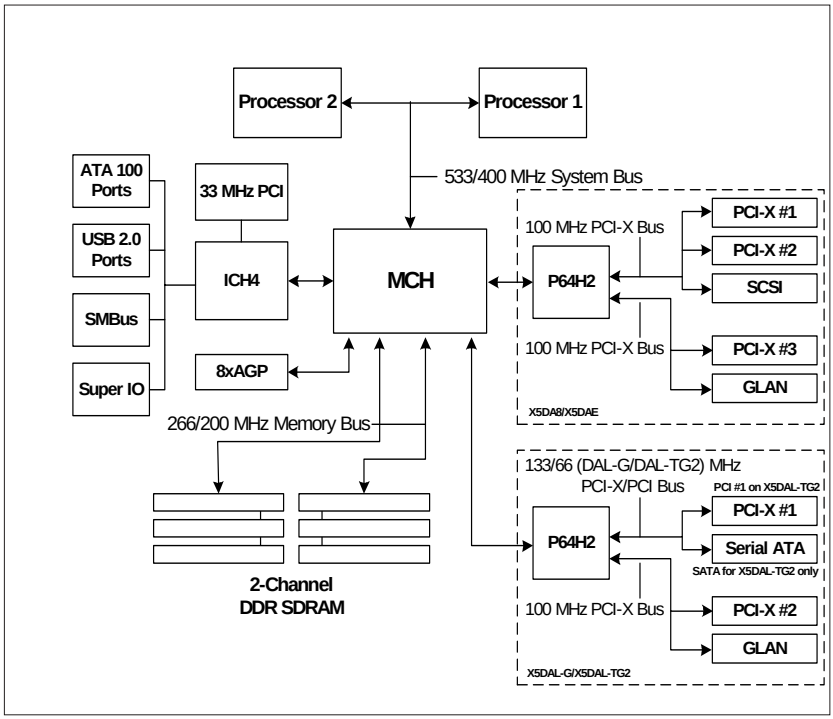


Figure 1-9. Intel E7505 Chipset: System Block Diagram

Note: This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of each motherboard.

1-2 Chipset Overview

The Intel E7505 chipset is a high-performance chipset with a performance and feature-set designed dual processor servers. The E7505 chipset consists of three major components: the Memory Controller Hub (MCH), the I/O Controller Hub 4 (ICH4) and the PCI-X 64-bit Hub 2.0 (P64H2).

The MCH has four hub interfaces, one to communicate with the ICH4 and three for high-speed I/O communications. The MCH employs a 144-bit wide memory bus for a DDR-266 memory interface, which provides a total bandwidth of 4.27 GB/s. The ICH4 interface is a 266 MB/sec point-to-point connection using an 8-bit wide, 66 MHz base clock at a 4x data transfer rate. The P64H2 interface is a 1 GB/s point-to-point connection using a 16-bit wide, 66 MHz base clock at an 8x data transfer rate.

The ICH4 I/O Controller Hub provides various integrated functions, including a two-channel Ultra ATA/100 bus master IDE controller, USB 2.0 host controllers, an integrated LAN controller, a System Management Bus controller and an AC'97 compliant interface.

The P64H2 PCI-X Hub provides a 16-bit connection to the MCH for high-performance IO capability and two independent 64-bit PCI-X interfaces.

1-3 Special Features

BIOS Recovery

The BIOS Recovery function allows you to recover your BIOS image file if the BIOS flashing procedure fails (see Section 3-3).

Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power-on state. See the Power Lost Control setting in the Advanced BIOS Setup section (Peripheral Device Configuration) to change this setting. The default setting is Always On.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the SUPER X5DA8/X5DAE/X5DAL-G/X5DAL-TG2. All have an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, Chipset Voltage, +3.3V, +5V, +12V and +3.3V Standby

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware/Software On/Off Control

The PC health monitor can check the RPM status of the cooling fans. The onboard 3-pin CPU and chassis fans are controlled by the power management functions. The thermal fan is controlled by the overheat detection logic.

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. It can continue to monitor for overheat conditions even when the CPU is in sleep mode. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal control fan to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It continues to operate when the system enters Standby mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.

CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded, both the overheat fan and the warning LED are triggered.

System Resource Alert

This feature is available when used with Intel's LANDesk Client Manager (optional). LDCM is used to notify the user of certain system events. For example, if the system is running low on virtual memory and there is insufficient hard drive space for saving the data, you can be alerted of the potential problem.

Auto-Switching Voltage Regulator for the CPU Core

The auto-switching voltage regulator for the CPU core can support up to 20A current and auto-sense voltage IDs ranging from 1.4V to 3.5V. This will allow the regulator to run cooler and thus make the system more stable.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 2000 and Windows NT 5.0.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

External Modem Ring-On

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, updates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboards have a 3-pin header (WOL) to connect to the 3-pin header on

a Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-LAN can only be used with an ATX 2.01 (or above) compliant power supply.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The SUPER X5DA8/X5DAE/X5DAL-G/X5DAL-TG2 accommodates ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You should use one that will supply at least 400W of power and includes the additional +12V, 8-pin power connector - an even higher wattage power supply is recommended for high-load configurations. Also your power supply must supply 1.5A for the Ethernet ports.

NOTE: Auxiliary 12v power (J15) is necessary to support Intel Xeon CPUs. Failure to provide this extra power will result in the CPUs becoming unstable after only a few minutes of operation. See Section 2-5 for details on connecting the power supply cables.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.It also provides two high-speed, 16550 compatible serial communication ports

(UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP) , Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMAs and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which suppport ACPI and APM (Advanced Power Management).

Chapter 2
Installation

2-1 Static-Sensitive Devices

Electric-Static-Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

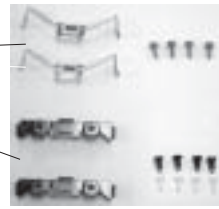
The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

2-2 PGA Processor and Heatsink Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU heat sink. Note that for the X5DAL-G/X5DAL-TG2 you need to install the Xeon mounting plate under the board.

1. Locate the following components, which are included in the shipping package.

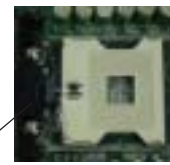


*These screws are for mounting the motherboard to the back panel of a chassis that has four mounting holes (as shown on right).

For chassis that do not have four mounting holes, use the anchor/peg assemblies:

2. Insert the white pegs into the black anchors. Do not force the white pegs all the way in - only about 1/3 of the way into the black anchors.

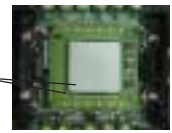
3. Place a retention bracket in the proper position and secure it by pressing pegs into two of the retention holes until you hear a *click*. The clicking sound indicates that the peg is locked and secured.


One retention bracket in position

4. Secure the other retention bracket into position by repeating Step 3.

5. Lift the lever on the CPU socket: *lift the lever completely or you will damage the CPU socket when power is applied*. *(Install CPU1 first.)*

6. Install the CPU in the socket marked "CPU1". Make sure that pin 1 of the CPU is seated on pin 1 of the socket (both corners are marked). When using only one CPU, install it into CPU socket #1 (CPU socket #2 is automatically disabled if only one CPU is used).



7. Press the lever down until you hear it *click* into the locked position.

8. Apply the proper amount of thermal compound to the CPU die and place the heatsink and fan on top of the CPU.

9. Secure the heatsink by locking the retention clips into their proper position.

10. Connect the three wires of the CPU fan to the respective CPU fan connector.

11. Repeat this procedure to install a second CPU in CPU socket #2.

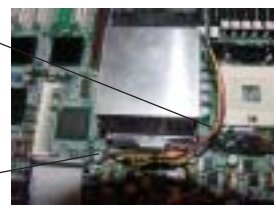
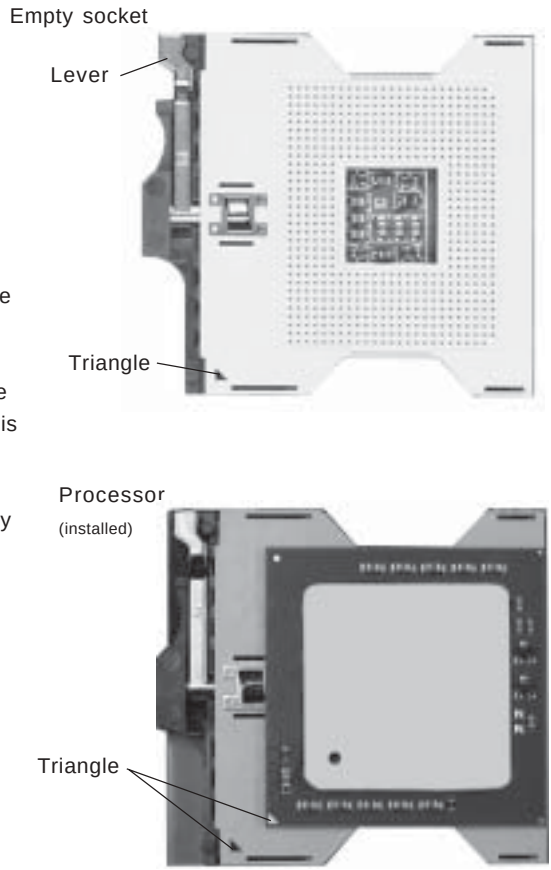


Figure 2-1. PGA604 Socket: Empty and with Processor Installed



Warning! Make sure you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure the location of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

2-3 Installing DIMMs

Note: Check the Supermicro web site for recommended memory modules: http://www.supermicro.com/TECHSUPPORT/FAQs/Memory_vendors.htm

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (See Figure 2-2)

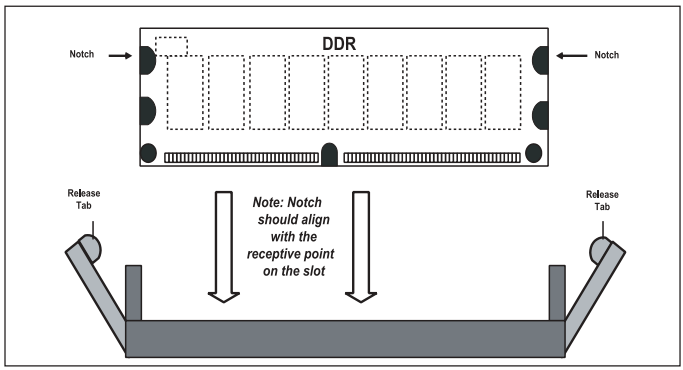
1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2, and so on.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

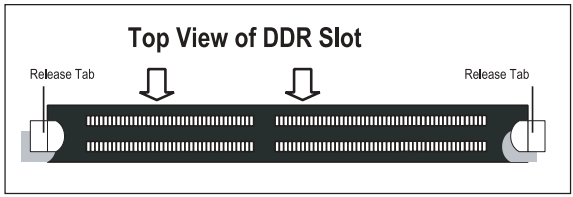
Memory Support

The X5DA8/X5DAE supports up to 12 GB of ECC registered DDR-266/200 (PC2100/1600) memory. The X5DAL-G/X5DAL-TG2 supports up to 8 GB of registered ECC or unbuffered DDR-266/200 (PC2100/1600) memory. All motherboards were designed to support 2 GB modules in each slot, but have only been verified with modules up to 1 GB in size.

Figure 2-2. Installing and Removing DIMMs

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.



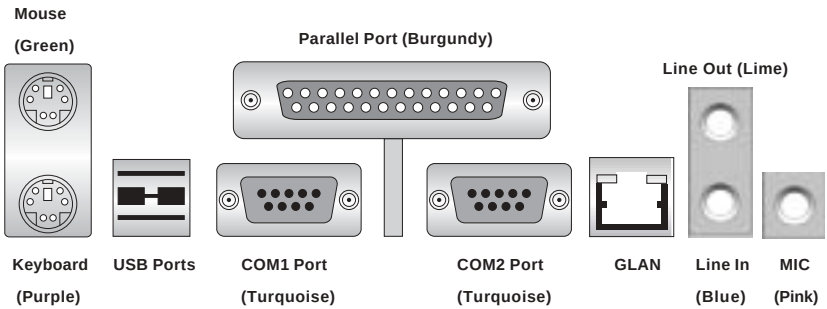


To Remove:
Use your thumbs to gently push near the edge of both ends of the module. This should release it from the slot.

2-4 I/OPorts/Control Panel Connectors

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 2-3 below for the colors and locations of the various I/O ports.

Figure 2-3. I/O Port Locations and Definitions

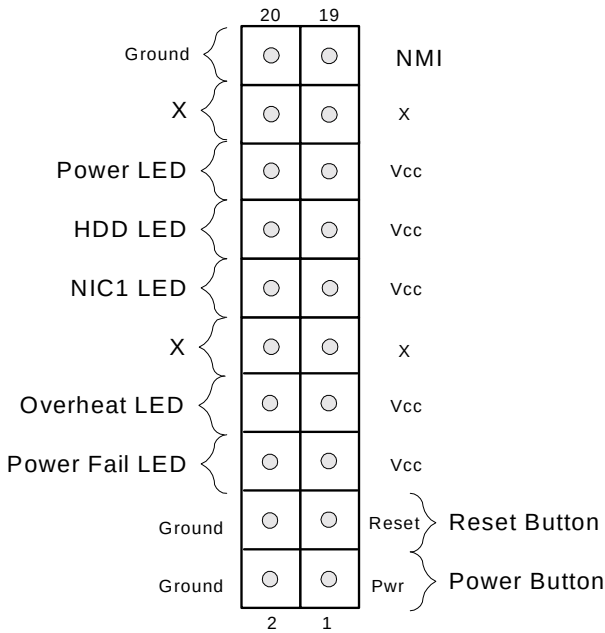


Note: The Line In, Line Out and MIC ports are not included on the X5DAL-G and X5DAL-TG2. The X5DAL-TG2 has two GLAN ports (see motherboard layout page).

Front Control Panel

JF2 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro server chassis. See Figure 2-4 for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

Figure 2-4. JF2 Header Pins



2-5 Connecting Cables

ATX Power Connector

The main power supply connector on the X5DA8/X5DAE/X5DAL-G/ X5DAL-TG2 meets the SSI (Superset ATX) 24-pin specification, however it also supports a 20-pin power supply connector. Make sure that the orientation of the connector is correct. See the table on the right for pin definitions.

ATX Power Supply 24-pin Connector Pin Definitions

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connector

In addition to the Primary ATX power connector (above), the 12v 8-pin Processor connector at J15 must also be connected to your power supply. See the table on the right for pin definitions.

8-Pin +12v Power Supply Connector (J15)

Pins	Definition
1 thru 4	Ground
5 thru 8	+12v

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF2. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF2)

Pin Number	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF2. Refer to the table on the right for pin definitions.

PWR_LED Pin Definitions (JF2)

Pin Number	Definition
15	Vcc
16	Control

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF2. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SCSI, Serial ATA and IDE). See the table on the right for pin definitions.

HDD LED Pin Definitions (JF2)

Pin Number	Definition
13	Vcc
14	HD Active

NIC LED

The NIC (Network Interface Controller) LED connection for the GLAN port is located on pins 11 and 12 of JF2. Attach the NIC LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC LED Pin Definitions (JF2)

Pin Number	Definition
11	Vcc
12	GND

Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF2 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (JF2)

Pin Number	Definition
7	Vcc
8	GND

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF2. Refer to the table on the right for pin definitions.

Power Fail LED Pin Definitions (JF2)

Pin Number	Definition
5	Vcc
6	GND

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF2. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Pin Definitions (JF2)

Pin Number	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF2. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in BIOS - see Chapter 4). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Connector Pin Definitions (JF2)

Pin Number	Definition
1	PW_ON
2	Ground

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Universal Serial Bus (USB0/1)

Two USB 2.0 ports are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions

USB0		USB1	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

Front Panel Universal Serial Bus Headers

Extra USB headers (FPUSB0/ FPUSB1/FPUSB2/FPUSB3) can be used for front side USB access. You will need a USB cable to use either connection. Refer to the tables on the right for pin definitions.

Front Panel Universal Serial Bus Pin Definitions

FPUSB0/FPUSB2		FPUSB1/FPUSB3	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

Serial Ports

The COM1 and COM2 serial ports are located under the parallel port (see Figure 2-3). See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port.

GLAN (Ethernet Port)

A G-bit Ethernet port (designated GLAN) is located beside the COM2 port on the IO backplane. This port accepts RJ45 type cables. The X5DAL-TG2 has two GLAN ports, which are designated GLAN1 and GLAN2.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located on J9. See the table at right for pin definitions. (See Figure 2-3 for the locations of each.)

PS/2 Keyboard and Mouse Port Pin Definitions (J9)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Fan Headers

The X5DA8/X5DAE/X5DAL-G/ X5DAL-TG2 has six fan headers, which are designated CPU Fan1, CPU Fan2, CPU1 Chassis Fan, CPU2 Chassis Fan, Chassis Fan1, Chassis Fan2 and Overheat Fan. See the table on the right for pin definitions.

Fan Header Pin Definitions

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: Fan headers are DC power.

Power LED/Speaker

On the JDI header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

Pin Number	Function	Definition
4	+	Red wire, Speaker data
5	Key	No connection
6		Key
7		Speaker data

Third Power Supply Fail Header

Connect a cable from your power supply to the JP8 header to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin on JF2 to indicate a power failure on the chassis. See the table on the right for pin definitions.

Third Power Supply Fail Header Pin Definitions (JP8)

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

Note: This feature is only available when using redundant Supermicro power supplies.

Wake-On-LAN

The Wake-On-LAN header is designated WOL. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this feature. You must also have a LAN card with a Wake-on-LAN connector and cable.

Wake-On-LAN Pin Definitions (WOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-on-Ring Pin Definitions (JWOR)

Pin Number	Definition
1	Ground
2	Wake-up

JSLED

The JSLED header is used to indicate Serial ATA drive activity. Connect the drive LED cable (should be a bundled or "ribbon" type cable) to the JSLED header.

Serial ATA Drive Activity Header Pin Definitions (JSLED)

Pin Number	Definition	Pin Number	Definition
1	SATA#1	6	N/C
2	SATA#2	7	N/C
3	SATA#3	8	N/C
4	SATA#4	9	N/C
5	N/C	10	N/C

Keylock

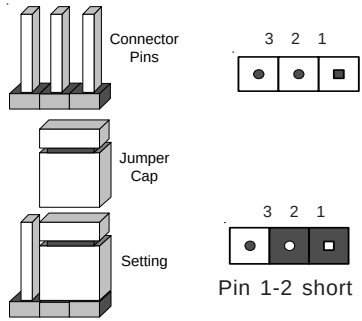
The keyboard lock connection is located on JP35. Utilizing this header allows you to inhibit any actions made on the keyboard, effectively "locking" it.

2-6 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS. To clear CMOS,
1) First shut down the system and unplug the power cord(s).
2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3) Remove the screwdriver (or shorting device).
4) Reconnect the power cord(s) and power on the system.
Note: *Do not use the PW_ON connector to clear CMOS*.

SCSI Enable/Disable (X5DA8)

The SCSI Termination jumper at JP34 allows you to enable or disable the onboard SCSI controller. The normal (default) position is on pins 1-2 to enable (terminate) the onboard SCSI. See the table on the right for jumper settings.

SCSI Enable/Disable Jumper Settings (JP34)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

GLAN Enable/Disable

JD4 (JPL1 on the X5DAL-G/ X5DAL-TG2) enables or disables the GLAN port(s) on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

GLAN Enable/Disable Jumper Settings (JD4/JPL1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Power Fail Alarm Enable/ Disable

If your system has three power supply units installed with one acting as a backup, you can be notified in the event of a power supply failure. If you only have one or two power supply units installed, you should disable this with JP9 to prevent false alarms. See the table on the right for jumper settings. The default setting is disabled.

Power Fail Alarm Enable/Disable Jumper Settings (JP9)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

CPU Chassis/CPU Fan Select (not on X5DAL-G/ X5DAL-TG2)

JP33 allows you to select to use either the CPU fan or the Chassis fan for the appropriate fan header. The default position is open to select the CPU fan. The CPU Chassis fan is intended for use with Supermicro chassis. See the table on the right for jumper settings.

CPU Chassis/CPU Fan Select Jumper Settings (JP33)

Jumper Position	Definition
Open	CPU Chassis
Closed	CPU Fan

USB Wake-Up

Jumper JPUSB is used in conjunction with the Keyboard Wake-Up function in BIOS when you wish to wake the system up with a USB keyboard that has been connected to a USB port (not header). Set JPUSB to pins 1-2 to support USB keyboard wake-up and resume from ACPI S1 mode and pins 2-3 pins to support USB keyboard wake-up and resume from ACPI S3 mode. See the table on the right for jumper settings.

Note: Your power supply must provide 5v of standby voltage with at least 1A to use this feature.

USB Wake-Up Jumper Settings (JPUSB)

Jumper Position	Definition
1-2	5v
2-3	5v Standby

Watch Dog

JP37 controls Watch Dog, a system monitor that takes action when a software application freezes the system. Pins 1-2 will have WD reset the system if a program freezes. Pins 2-3 will generate a non-maskable interrupt for the program that has frozen (requires software implementation). Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings (JP37)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled

Thermal Fan Control

Depending on the system temperature, the thermal fan can run at two speeds (12V and 9V levels). With JP38 open, the speed of this fan will change according to the temperature sensed by hardware control. When closed, the fan will always run at full (12V) speed. See the table on the right for jumper settings.

Thermal Fan Control Jumper Settings (JP38)

Jumper Position	Definition
Open	HWare Control
Closed	Full Speed

Default setting is open. Running at 9V reduces the fan noise level.